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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/036,789	12/21/2001	Gerald G. Pecharnek	800.0119	5428

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EXAMINER

ENG, DAVID Y

ART UNIT	PAPER NUMBER
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2155

DATE MAILED: 03/30/2004

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Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application N .

10/036,789

Applicant(s)

PECHANЕК ET AL.

Examiner

DAVID Y. ENG

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 24 January 2004.  
2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.  
3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1,44-52 and 57-59 is/are pending in the application.  
4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.  
5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.  
6) ☒ Claim(s) 1,44-52 and 57-59 is/are rejected.  
7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.  
8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.  
10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).  
11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)  
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)  
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_.  
4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_.  
5) ☐ Notice of Informal Patent Application (PTO-152)  
6) ☐ Other: \_\_\_\_\_.

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Claims 2-43 and 53-56 have been cancelled. The active claims are 44-52 and 57-59.

The double patenting rejection has been withdrawn in view of the submitted Terminal Disclaimer.

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1, 44-52 and 57-59 are rejected under 35 U.S.C. 102(a) as being clearly anticipated by Applicants' admitted prior art.

With respect to claim 1, see Figure 1 and the corresponding description in the specification. Figure 1 shows an interconnection system (the system which connects the PEs) for a plurality of processing elements (PE00 and PE01), each PE having a communications port (inherent) for transmitting and receiving data and commands, the interconnection system comprising:

inter-PE connection paths (the path which connects PE00 and PE01) and a cluster switch (the circuit which renders PE00 and PE01 be able to transceiving commands and data between them) connected to said PEs so as to combine mutually exclusive inter-PE connection paths and to thereby substantially reduce the number of communications paths required to provide inter-PE connectivity equivalent to that of conventional torus-connected PE arrays.

With respect to claims 44, 45, 46, 47, 48, 49, 50, 52, 57, 58, 59, see Figure 2. Figure 2 teaches an array processor comprising:

a plurality of processing elements arranged in clusters (cluster A includes PE10 and PE01, cluster B includes PE20 and PE02), each cluster including processing elements which communicate in mutually exclusive torus directions with the processing elements of at least one other cluster; and

cluster switches (the circuit which renders cluster A and cluster B be able to transceiving commands and data between them) connected to the clusters to provide said mutually exclusive torus (wrap around) direction communication.

With respect to claim 51, see line 8 of page 2 of the specification.

In the communication filed on 1/22/2004, Applicants contend that the prior art does not have a cluster switch. The cluster switch is recited to be connected to the PEs for communication. The prior art PEs as described in the specification clearly are connected in torus manner and they includes switches so that the PEs are able to communicate. It is not seen how the cluster switch as recited is able to combine mutually exclusive inter-PE connection paths. The claims did not clarify 1. what substantial number of communication paths are and 2. what the connectivity equivalent to that of conventional torus-connected PE arrays is. The prior art therefore meets the claim limitation regardless the number of paths required in the prior art. Note that the claims should be given their broadest reasonable interpretation. In re Morris, 127 F.3d 1048, 1054-55, 44 USPQ2d 1023, 1027-28 (Fed. Cir. 1997). Limitations appearing in the specification but not recited in the claim are not read into the claim. In re Prater, 425 F.2d 1393, 1404-05, 162 USPQ 541, 550-551 (CCPA 1969). See also MPEP 2114. Apparatus claims must be structurally distinguishable from the prior art. In re Danly, 263

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F.2d 844, 847, 120 USPQ 528, 531 (CCPA 1959). The PEs shown in figures 1 and 2 are clearly interconnected and are able to communicate with each other through switches.

Claims 1, 44-52 and 57-59 are rejected under 35 U.S.C. 102(b) as being clearly anticipated by Barker (USP 5,717,943).

With respect to claims 1 and 44-50, 52 and 57-59, Barker teaches an array processor (see flat layout of 4D torus 32768 processing element in Figure 6 and also processing element array (n Clusters of 512 PEs in Figure 21) comprising:

inter-PE connection paths (see the paths which connect the PEs in Figure 11);  
a plurality of processing elements arranged in clusters (see n clusters in Figure 21), each cluster including processing elements which communicate in mutually exclusive torus directions with the processing elements of at least one other cluster; and  
cluster switches(n cluster controllers in Figure 21) connected to the clusters to provide said mutually exclusive torus direction communication.

Cluster switch (cluster controller) by definition reduces the number of communications paths required to provide inter-PE connectivity equivalent to that of conventional torus-connected PE arrays.

With respect to claim 51, see SIMD in line 4 of column 24, line 14 of column 42 line 54-65 of column 48. See also "broadcast and SIMD" in column 36.

In the communication filed 1/22/2004, Applicants contended that Barker does not have cluster switches. The cluster switches are recited to be connected to provide communications between clusters. The cluster controllers of Barker clearly meet the

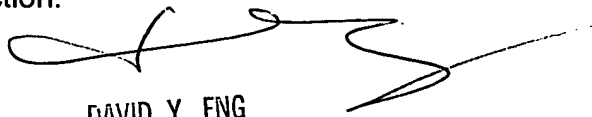
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limitation. Applicants appear to contend that Barker did not teach providing mutually exclusive torus direction communication. Applicants fail to provide any explanation as to how the cluster switch as recited is able to provide mutually exclusive torus direction communication. There are no details of a cluster switch recited in the claim to show how that is being done. Note also that Barker's PEs are connected in torus (Figure 6). Note further that all toruses are by definition mutually exclusive from each other (see Applicants' Figures 1 and 2).

The Keckler reference (USP 5,574,939) is cited to show cluster switch (see abstract and Switch C in Figure 2).

**THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.



DAVID Y. ENG  
PRIMARY EXAMINER